

Test

1

Answer the following questions.

A Choose the correct answer :

(8 marks)

- 1 The sum of reactants masses in any chemical reaction is the sum of products masses.
 - (a) doubled
 - (b) more than
 - (c) equal to
 - (d) less than

- 2 The bar used in the electromagnet is made up of
 - (a) isolated cooper.
 - (b) steel iron.
 - (c) wrought iron.
 - (d) aluminium.

- 3 The car brake performance is an application of
 - (a) gravitational forces.
 - (b) friction forces.
 - (c) centrifugal forces.
 - (d) forces of inertia.

- 4 In the periodic motion,
 - (a) the pathway is straight.
 - (b) motion is regularly repeated.
 - (c) mass is regularly repeated.
 - (d) speed is regularly changed.

B Give a reason for the following :

(2 marks)

The car passengers are rushed forward when the car stops suddenly.

Test**2**

Answer the following questions.

A Choose the correct answer :

(8 marks)

1 All of the following are periodic motions, except the

- (a) fan motion.
- (b) pendulum motion.
- (c) train motion.
- (d) sunflower motion.

2 A force is an effect that

- (a) always changes the state of an object's motion.
- (b) never changes the state of an object's motion.
- (c) always changes both object's position and direction.
- (d) may change the state of an object's motion.

3 If the molecule of carbon dioxide consists of one atom of carbon and two atoms of oxygen, knowing that the mass of carbon is 12 and that of oxygen is 16, so the mass of two molecules of carbon dioxide equals gm.

- (a) 22
- (b) 44
- (c) 88
- (d) 33

4 When the horse is tripped, the horse rider is suddenly rushed forward, this is related to the force of

- (a) inertia.
- (b) centrifugal.
- (c) attraction.
- (d) horse pushing.

B If the Earth's gravitational acceleration in a place is 9.8 m/sec^2 , find the weight of the following :

(2 marks)

1 0.3 Kg mass ball.

2 50 Kg mass ball.

Test

3

Total mark

10

Answer the following questions.

A Choose the correct answer :

(8 marks)

B Mention one benefit (use) of electric winches :

(2 marks)

Total mark

10

Test**4**

Answer the following questions.

A Choose the correct answer :

(8 marks)

1 waves is an example of mechanical waves.

- (a) Water
- (b) Light
- (c) Radio
- (d) Ultraviolet

2 Ammonia combines with conc. HCl producing of ammonium chloride.

- (a) white ppt.
- (b) brown clouds
- (c) white clouds
- (d) brown ppt.

3 An object's weight on the Earth's surface is related to the forces.

- (a) electromagnetic
- (b) gravitational
- (c) weak nuclear
- (d) strong nuclear

4 is a technological application on inertia forces.

- (a) Car tyres
- (b) Contraction and relaxation of muscles
- (c) Safety belts
- (d) Electromagnet.

B Compare between light and sound waves (one point only of each).

(2 marks)

Test**5**

Answer the following questions.

A Choose the correct answer :

(8 marks)

- 1 The following forces and operations are applications of friction,
 - (a) walking on the road.
 - (b) car motion due to rotation of its wheels.
 - (c) operation of dynamo (electric generator).
 - (d) stopping the car using the brakes.

- 2 The amount of Earth's gravitational pull on the object is
 - (a) object's mass.
 - (b) object's weight.
 - (c) Earth's gravitational acceleration.
 - (d) centrifugal force.

- 3 The bright magnesium ribbon changes into a white powder of when it burns in air.
 - (a) magnesium nitrate
 - (b) magnesium oxide
 - (c) magnesium hydroxide
 - (d) magnesium dioxide

- 4 All of the following are electromagnetic waves,
 - (a) thermal (infrared) rays.
 - (b) visible light.
 - (c) sound waves.
 - (d) ultraviolet rays.

B What happens when ... ?

(2 marks)

An electric current flows through the isolated copper wire which is coiled spirally around a plastic tube containing iron bar and approach it to iron filings.

Answers of Science

Answers of Test

1

- A** 1 (c)
3 (b)

- 2 (c)
4 (b)

B Due to inertia, as they try to maintain their state of motion.

Answers of Test

2

- A** 1 (c)
3 (c)

- 2 (d)
4 (a)

B The weight of the object = object's mass × Earth's gravitational acceleration
 1 The weight of the ball = $0.3 \times 9.8 = 2.94$ newton.
 2 The weight of the ball = $50 \times 9.8 = 490$ newton.

Answers of Test

3

- A** 1 (c)
3 (b)

- 2 (a)
4 (d)

B They are used to lift scrap iron and cars in ports.

Answers of Test

4

- A** 1 (a)
3 (b)

- 2 (c)
4 (c)

B Light waves : from electromagnetic waves.

Sound waves : from mechanical waves.

Answers of Test

5

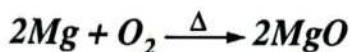
- A** 1 (c)
3 (b)

- 2 (b)
4 (c)

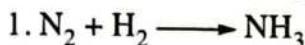
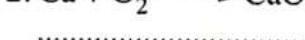
B The iron nail is changed into a temporary magnet due to flowing of an electric current through the wire, then it will attract the iron filings.

Worksheet**6****1. A. In the following reaction :**

(New Cairo Zone / Cairo 2019)



1. The bond in oxygen molecule is broken to give atoms.
2. Magnesium atom combines with atom to form molecule.
3. Given that the mass of (Mg) = 24 and that of (O) = 16

Calclute the total mass of the products......
.....
.....**B. Rewrite the following chemical equations after balancing them :**.....
.....
..........
.....
..........
.....
.....**2. Give reasons for :**

1. On burning a magnesium ribbon in air, a white powder is formed.

.....
.....
.....

2. The chemical equation should be balanced.

(Science Inspectorate / Giza 2022)

.....
.....
.....**3. What is meant by ... ?**

1. Chemical reaction :

.....
.....
.....

2. Law of constant ratios :

.....
.....
.....**4. Express the reaction of hydrogen with oxygen to form water by balanced symbolic and word equations with achieving the law of conservation of matter.
[knowing that the atomic mass of H = 1 and O = 16]**.....
.....
.....

Worksheet

7

1. What happens in each of the following :
 [Explain your answer with balanced chemical equation] :

1. Putting a glass rod wet with conc. hydrochloric acid close to the opening of a test tube containing ammonia solution.

(Samanoud Zone / Gharbia 2019)

2. Burning a piece of coal in air.

2. A. Write the scientific term :

1. Reactions which involve combination between a compound with another or an element with another. (*Shoubra El-Khima Zone / Al-Qalyoubia 2022*) (.....)
2. Oxides that cause building corrosion.

(*El-Salam Evangelical Sch. / Ismailia 2019*) (.....)

3. The gas which causes a greenhouse effect. (*Brilliance Sch. / Alex. 2019*) (.....)

B. Write a short paragraph on greenhouse phenomenon.

.....

3. Give reasons for :

1. Lightning causes environmental pollution.

.....

2. Risk of nitrogen oxides on human health.

.....

4. Compare between carbon oxides and sulphur oxides [Concerning : Examples – The negative effect] :

Points of comparison	Carbon oxides	Sulphur oxides
1. Examples :
2. The negative effect :

Worksheet**8****1. A. What is meant by ... ?**

1. Force :

(El-Dokki Zone / Giza 2019)

2. Object's weight :

(Samanoud Zone / Gharbia 2019)

B. Complete the following statements :

1. When a racket hits the tennis ball, a acting on the ball causing the change of its
2. , electromagnetic forces, and are the main three divisions of forces in the nature.

2. A. Choose the correct answer :

1. All of the following are examples for some fundamental phenomena except
a. thunder. b. wind motion. c. water motion. d. lightning.
2. is the measuring unit of the force.
a. Newton b. Metre c. Kilogram d. Coulomb
3. All of the following are from the effects of the force except
a. moving a static object.
b. changing the direction of a moving object.
c. changing object's mass.
d. increasing the speed of a moving object.

B. Give reasons for :

1. Object weight changes from one place to another on the Earth's surface.

(Sohag Zone / Sohag 2019)

2. When you push a wall, it doesn't move.

3. A. 1. Calculate the weight of an object of 5 kg mass [Knowing that the acceleration due to gravity is 10 m/sec^2].

(Giza 2022)

2. Calculate the mass of a child, its weight is 392 newton. [knowing that the acceleration due to gravity is 9.8 m/sec^2].

(Cairo 2022)

B. Put (✓) or (✗) :

1. Object's weight is a fixed value, while the object's mass changes from a place to another on the Earth's surface. ()
2. The exerted work to lift an object increases by increasing the object's mass. ()
3. The mass of a person at the equator is less than that its mass at the two poles. ()

(Shebin El-Kom Directorate / Menofia 2019)

4. What happens in the following cases ... ?

1. When the object's mass increases (concerning the object's weight).

.....
.....

2. When you kick a static ball with your foot.

.....
.....

Worksheet 9
1. Choose from column (B) what suits it in column (A) :

(A)	(B)
1. Electric motor	a. changes the mechanical energy into electric energy.
2. Electromagnet	b. changes the electric energy into mechanical energy.
3. Electric generator	c. changes the electric energy into magnetic energy.

1. 2. 3.

2. A. Complete the following :

(Basateen & Dar Al Salam Adm. / Cairo 2019)

1. Egypt seeks to use energy in producing electricity.
2. The nuclear forces can be divided into and
3. An atom stores a massive amount of energy inside its
4. The fan and electric mixer are from devices that change energy into energy.

B. What is the importance of ... ?

1. Strong nuclear forces :

.....
.....

(East Naser City Directorate / Cairo 2019)

2. Weak nuclear forces :

.....
.....

(Basateen & Dar Al Salam Adm. / Cairo 2019)

3. What are the forces responsible for each of the following :

1. Falling of objects towards the Earth's surface. (.....)

2. Changing the mechanical energy into electric energy. (Alex. 2022) (.....)

3. Producing electricity from nuclear energy. (.....)

4. The emission of some invisible radiations from radioactive elements. (.....)

Worksheet 10**1. A. Complete the following :**

(Hafr El-Baten Sch. / Giza 2019)

1. and are from the accompanied forces to motion.
2. Passengers are once the vehicle moves forward suddenly after it was at rest due to force.

B. Choose the correct answer :

1. When the horse is tripped, the horse rider is suddenly rushed forward, this is related to the force of
 - a. inertia.
 - b. centrifugal.
 - c. gravitational.
 - d. horse pushing.
2. is a technological application on inertia.
 - a. Car tyres
 - b. Safety belts
 - c. Pulse inside blood vessels
 - d. Cars' brakes

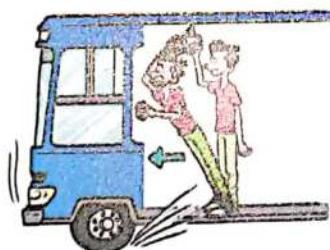
2. Which of the two figures represents stopping the bus suddenly and which one represents moving the bus suddenly ? (Give a reason) .

Fig. (1)



Fig. (2)

3. A. What is meant by inertia ?

(El-Gomrok Zone / Alex. 2019)

B. Put (✓) or (✗), then correct the wrong ones : (Shebin El-Kom Directorate / Menofia 2019)

1. The football player is rushed forward and falls down if he is tripped during running.
()
2. Force is a property of an object has to resist the change of its state.
()

4. Give reasons for :

1. The car passengers are rushed forward when the moving car stops suddenly.
-

(El-Beheira 2022)

2. Policemen advise drivers to use safety belts in cars.
-

(El-Salam Evangelical Sch. / Ismailia 2019)

3. The person falls on his face if he collides with a stone while running.
-

Worksheet**11****1. A. What is meant by friction force ?**

(Abo-Salem Sch. / Sharkia 2019)

B. Put (✓) or (✗), then correct the wrong ones :

1. Heart muscle contraction and relaxation helps the heart to pump blood all over the body organs.

()

2. Liquids transport through pores and the walls of cells from the higher concentration to the lower one.

(Shebin El-Kom Directorate / Menofia 2019)

()

3. Asphalt is more rough in curved roads to reduce friction forces.

()

2. Mention :

1. Three benefits of friction.

(El-Gomrok Zone / Alex. 2019)

.....
.....
.....

2. Three of the biological operations related to the forces inside living systems .

.....
.....
.....**3. Give reasons for :**

1. Lubricating and oiling of mechanical machines.

(Brilliance Sch. / Alex. 2019)

2. Car tyres are covered with a very coarse substance.

(Cairo 2022)

Worksheet 12 on Lessons 1 & 2 Unit Two**1. Correct the underlined words :**

1. The idea of lubricating machines depends on reducing its speed. (.....)
2. Electromagnet is used in making the calculator. (.....)
3. The liquids transport through pores and the walls of cells from the lower concentration to higher one by the effect of inertia forces. (.....)
4. Egypt seeks to use mechanical energy in producing electricity. (.....)
5. Car brakes are from applications on Earth's gravitational forces. (.....)

(Ismailia 2022)

2. Mention three harms of friction.

.....
.....
.....

3. A. Write the scientific term :

1. The product of multiplying object's mass by Earth's gravitational acceleration.

(Patriarchal College / Cairo 2019) (.....)

2. Resistant forces originated between the object in motion and the medium touching it.

(New Cairo Zone / Cairo 2019) (.....)

3. An instrument used to change the mechanical energy into electric energy.

(Assiut 2022) (.....)

B. If the Earth's gravitational acceleration at the Earth's surface is 9.8 m/sec^2 and it becomes 9.2 m/sec^2 at a height of 200 km above the Earth's surface level. Calculate the amount of decrease in the weight of a person, its mass is 75 kg at this height.

.....
.....
.....

4. A. Complete the following :

1. Policemen advise drivers to use in cars and planes, as they act on stopping the forces of
2. Electromagnet changes energy into energy.

(Al-Resala Sch. / Qalyoubia 2019)

3. Liquids transport through the walls of the cells from the concentration to the concentration.

B. What happens when ... ?

1. Migration of a bird from the south pole to the equator (related to : the mass and the weight of the bird).
.....
.....

(Al-Resala Sch. / Qalyoubia 2019)

2. A moving bus stops suddenly (concerning the driver and the passengers).
.....
.....

(Menofia 2022)

Worksheet 13

1. A. Give one example for :

(Omrania Zone / Giza 2019)

1. Circular motion :
 2. Wave motion :
 3. Vibrating motion :

B. Choose the correct answer :

1. In the periodic motion, the
a. pathway is straight. b. motion is regularly repeated.
c. time is regularly repeated. d. speed is regularly changed.

2. All of the following are periodic motions except the (A)
a. movement of the Moon around the Earth. b. pendulum motion.
c. train motion. d. sunflower motion.

2. Define each of the following :

1. Periodic motion :

2. Relative motion :

(Cairo 2022)

3. Transitional motion :

.....

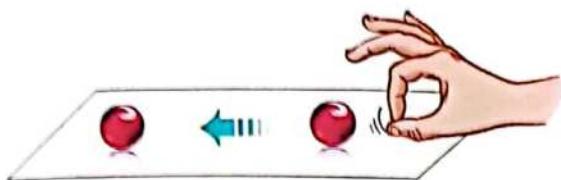
3. Complete the following statements :

1. and are from the examples of transitional motion.
(Al-Resala Sch. / Qalyoubia 2019)

2. If you are in a stopping car and another car moves forward beside you, you will imagine that your car moves

3. Types of motion are motion and motion. (Saint Mary Sch. / Cairo 2019)

4. Mention the type of motion represented by each figure :



(1)



(2)



(3)



(4)

Worksheet

14

1. Compare between mechanical waves and electromagnetic waves (giving examples) :

(Assiut 2022)

Mechanical waves	Electromagnetic waves
.....
.....
.....
.....
.....

2. A. Complete the following statements :

1. and rays are emitted from the Sun.
2. The waves causing the wave motion are divided into two types which are and

B. Put (✓) or (✗) :

1. Flute and lute are examples of pneumatic musical instruments. ()
2. Gamma rays, X-rays and ultraviolet rays are used in medical purposes. ()

3. Give reasons for :

1. We see lightning before hearing thunder.

(El-Menia 2022)

.....
2. We receive the sunlight and we don't hear the sound of solar explosions.

(Al-Resala Sch. / Qalyoubia 2019)

3. Astronauts can't hear each other voices directly in the space.

(Ismail El-Habrouk Sch. / Behira 2019)

4. A. Mention one application for the electromagnetic waves used in the following fields :

1. Medical field :

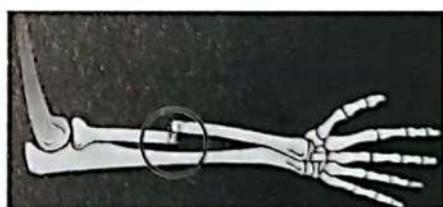
2. Photography field :

3. Heat field :

4. Remote sensing field :

B. The opposite figure shows a fracture in the bones of one arm :

1. Mention the name of the waves used for this type of photography, then mention another technological application for these waves.



2. What is the difference between these waves and sound waves ?

General Exercise of the School Book



on Unit Two

1. Choose the correct answer :

1. A force is an effect that
 - a. always changes the state of an object motion.
 - b. never changes the state of an object motion.
 - c. always changes an object position and direction.
 - d. may change the state of an object motion.
2. An object's weight on the Earth's surface is related to the forces.
 - a. electromagnetic
 - b. gravitational
 - c. weak nuclear
 - d. strong nuclear
3. The amount of Earth's gravitational pull on the object is
 - a. object's mass.
 - b. object's weight.
 - c. gravitational acceleration.
 - d. centrifugal force.
4. Electromagnetic forces affect on the operation of the following except for the
 - a. dynamo (electric generator).
 - b. electric motor.
 - c. car internal combustion engine.
 - d. electromagnet.
5. When the horse is tripped, the horse rider is suddenly pushed forward, this is related to the force of
 - a. inertia.
 - b. centrifugal.
 - c. gravitational.
 - d. the horse pushing.
6. The following forces and operations are an application on friction except for
 - a. walking on the road.
 - b. car motion due to rotation of its wheel.
 - c. operation of dynamo (electric generator).
 - d. stopping the car using the brakes.
7. All of the following are periodic motions except for
 - a. the fan motion.
 - b. the pendulum motion.
 - c. the projectiles motion.
 - d. the light waves.
8. All of the following are electromagnetic waves except for the
 - a. thermal (infrared) rays.
 - b. visible light.
 - c. sound waves.
 - d. ultraviolet rays.

2. A. What is meant by ... ?

1. Relative motion.

.....
.....

2. Periodic motion.

.....
.....

3. An object's weight is 60 N.

.....
.....

4. Inertia.

.....
.....

B. Give reasons for :

1. Gravitational acceleration is changed on Earth's surface from a place to another.

.....

2. An object's weight is changed from a place to another.

.....

3. When a car stops suddenly, passengers are rushed forward.

.....

C. Give the scientific term :

1. An object's position changes as time passes from its initial position
to a different final one. (.....)

2. The amount of Earth's gravitational pull on an object. (.....)

Answer the following questions :

Question 1 14 marks

A Choose the correct answer :

1. The movement of sound and light waves is motion.
a. transitional b. vibrating c. circular d. wave
2. From harms of friction forces is
a. stopping the car when using the brakes.
b. landing slowly when using parachut.
c. rising of blood in veins against gravity.
d. increasing the temperature of gears of machines when operated for a long time.
3. From forces enable living organisms to do biological operations
a. pulse. b. friction. c. inertia force. d. all the previous.

(Saint Mary Sch. / Cairo 2019)

4. are used in examining bones.
a. Ultrasonic waves b. Gamma rays c. Infrared rays d. X-rays

(Abo-Salem Sch / Sharkia 2019)

B The opposite figure shows the idea of working of a device :

1. What is the name of this device ?

.....

2. What is the changes of energy in this device ?

.....

3. What happens when you disconnect one end of the wire from the battery ? What do you conclude ?

.....



C Mention one benefit of friction.

(Damietta 2019)

.....

Question 2 14 marks

A Complete the following :

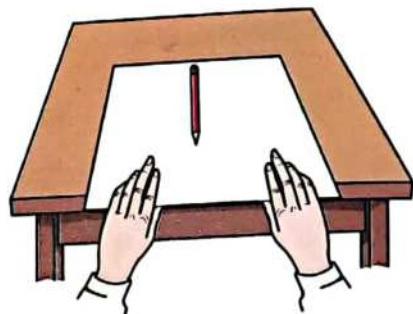
1. Friction is a resistant force originated between and
2. When an object transfers from the equator to the north pole, is changed, while remains fixed.

3. The violin and the guitar are among musical instruments, while flute and reed pipe are among musical instruments.
4. Strong nuclear forces are used in producing and in purposes.

(Belkas Zone / Dakahlia 2019)

B In the opposite figure :

What happens to the pen when pulling the paper quickly ?
(Give a reason)



C Calculate the mass of an object, its weight is 98 newton. Knowing that the Earth's gravitational acceleration = 9.8 m/sec^2

(Sohag Zone / Sohag 2019)

Question 3 14 marks

A Write the scientific term :

1. The effect that attempts to change the object's state from being static to motion or vice versa. *(Fayoum 2019) (.....)*
2. Waves produced due to the vibration of medium particles. *(.....)*
3. Motion which is regularly repeated in equal periods of time. *(.....)*
(El-Beheira 2022)
4. The ability of the Earth to attract an object to its centre. *(El-Menia 2022) (.....)*

B Mention an application / importance for each of the following : *(Al-Resala Sch. / Qalyoubia 2019)*

1. X-rays :
2. Friction force :
3. Infrared rays :
4. Weak nuclear force :

C Give a reason for :

Infrared rays are used in cooking food.

Question 4 14 marks**A Choose from column (B) what suits it in column (A) :**

(Qena 2022)

(A)	(B)
Type of motion	Example
1. Vibrating motion	a. motion of sound waves.
2. Circular motion	b. motion of a train from station to another.
3. Wave motion	c. movement of the Moon around the Earth. d. motion of the simple pendulum.

1. 2. 3.

B Put (✓) or (✗) :

- Ultraviolet rays are used in examining mineral raws in industry. ()
- Dynamo changes the heat energy into electric energy. ()
- Passengers are rushed forward when the moving car stops suddenly. ()
- Earth's gravitational acceleration increases by approaching to the Earth's centre. ()

C Compare between light and sound waves (One point only for each)

(Al-Resala Sch. / Qalyoubia 2019)

Model Exam 2

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Answer the following questions :

Question 1 14 marks**A Correct the underlined words :**

- Strong nuclear forces are used in generating solar energy. (.....)

(El-Dokki Zone / Giza 2019)

- Safety belts in cars work on increasing the forces of inertia. (.....)

(El-Dokki Zone / Giza 2019)

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3. Friction causes a great loss of chemical energy. (.....)
 (El-Gomrok Zone / Alex. 2019)
4. The motion of simple pendulum is an example of wave motion. (.....)
 (El-Gomrok Zone / Alex. 2019)

B Mention one use of each of the following :

1. Electric winches :
2. Weak nuclear force :
3. Gamma rays :
4. Visible light :

C What is meant by ?

Mechanical waves :

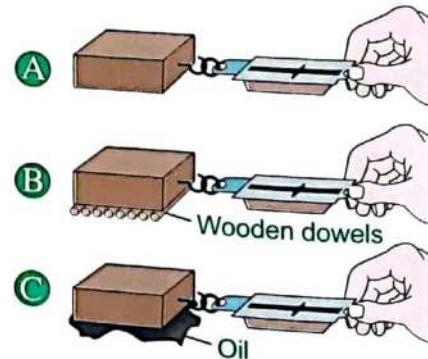
Question 2 14 marks

A Choose the correct answer :

1. If you know that the Earth's gravitational acceleration is 9.8 m/sec^2 , so the weight of an object its mass is 70 kg on Earth equals newton.
 a. 5.88 b. 58.8 c. 686 d. 885
2. is the scientist who discovered the Earth's gravitational.
 a. Planck b. Newton c. Archimeds d. Coulomb
3. All of the following are periodic motions except the (Fayoum 2019)
 a. fan motion. b. pendulum motion. c. train motion. d. sunflower motion.
4. Electromagnet is used in making the (Belkas Zone / Dakahlia 2019)
 a. cooking food. b. electric bell. c. microscope. d. data show.

B Look at the opposite figures, then answer the following questions :

- (1) Friction in **B** is (greater/less) than in **A**.
- (2) With lubrication (Fig. **C**) you need (more/less) force to move an object.
- (3) Lubrication (increases/decreases) friction.



C What happens when ... ?

(Omrania Zone / Giza 2019)

An electric current passes through an insulated copper wire coiling around a bar of iron.

Question 3 14 marks**A Put (✓) or (✗), then correct the wrong one :**

1. The mass of a person at the equator is less than its mass at the two poles.

()

2. Brakes are from examples of forces inside living systems.

()

3. Object's weight = its mass + gravitational acceleration.

()

4. Electric generator converts heat energy into electric energy. (Patriarchal College / Cairo 2019)

()

B What is the force responsible for each of the following ... ?

1. Falling the coin inside the cup on pulling the paper placed on the top of a glass cup quickly.

.....

2. Ease of the movement on asphalt and difficulty on the gravel.

.....

3. Pulse inside the blood vessels.

.....

4. The rise of water and salts from the soil to the leaves of plant.

.....

C Give a reason for :

Sound needs a medium to travel through, while light travels through space.

.....

Question 4 14 marks**A Write the scientific term of each of the following :**

1. The force that accompanies the massive amount of energy and it stored in the nucleus.

(New Cairo Zone / Cairo 2019) (.....)

2. The property of object resistance to change its state from rest or movement unless force affect on it.

(Patriarchal College / Cairo 2019) (.....)

3. It is an effect that attempts to change state of an object from static to motion or vice versa.

(Qena 2022) (.....)

4. Changing an object's position as time passes from its initial position to final one.

(Hafir El-baten Sch. / Giza 2019) (.....)

B Cross out the odd word, then mention the scientific name of the rest :

1. Light waves – Sound waves – Microwaves – Radio waves. (Ismail El-Habrouk Sch. / Behira 2019)

2. Gravitational force – Friction force – Nuclear force. (Port Said 2022)

3. Light waves – Sound waves – Water waves. (Assiut 2022)

4. Electric generator – Electric motor – Electric bell – Handbell.

C Compare between (two points only) :

Transitional motion and periodic motion.

Transitional motion	Periodic motion
.....
.....
.....
.....



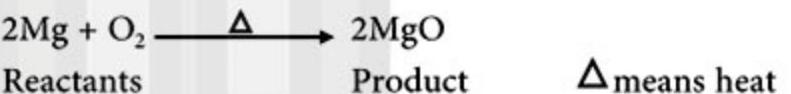
Unit one

Lesson 3

3

Chemical reactions & equations

- We can say that a chemical reaction occurred, when you mix two or more substances and you get at least one new substance
 - The substances that are mixed together or involved in reaction are called **Reactants**; the new substances produced are called **Products**.
 - A chemical reaction is represented by a chemical equation as the following one:



Chemical equation

It is a set of symbols and chemical formulae that represents the molecules.



Example:

Burning of magnesium in presence of oxygen



- The heat breaks down the double covalent bond in oxygen molecule
 - Now we have two active oxygen atoms.
 - Each oxygen atom combines with Mg atom by an ionic bond forming MgO ($Mg^{+2}O^{-2}$)
 - So we can see that a bond in reactant molecules has been broken and a new bond is formed in the molecule of product.

Chemical reaction

It is breaking of existing bond in molecule of reactants and forming new bond in molecule of product.





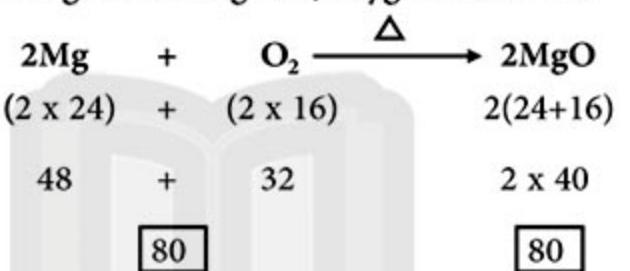
-A chemical equation should be balanced (G.R.F.) because the number of reactant atoms must be equal to the number of product atoms.

Law of constant ratio:

Calculate the mass of reactants and products in the following equation



Knowing that mass of magnesium Mg = 24, oxygen mass = 16



☞ This means that we can get MgO by reaction between Mg and O with any amount but we have to keep the ratio of Mg: O as 3 : 2

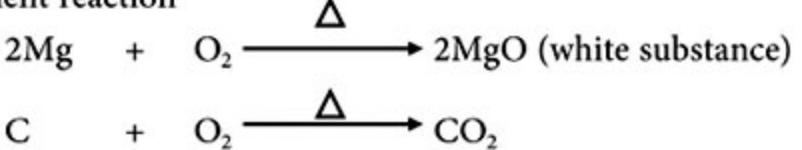
Law of constant ratio :

Any compound is produced from chemical combination between the elements of its molecule by constant weight ratio.

Types of chemical reactions:

1-Direct combination reaction :

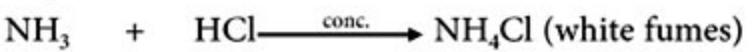
1) Element with element reaction



2) Element with compound reaction



3) Compound with compound:





Chemical reaction in our life

- a) We can transform less used substances to more useful substances
 - b) Used in many industries like fertilizers, medicines, fuel and plastic
- But chemical reaction can also have negative effect due to emission of harmful substances which pollute the environment and harm the human.

Negative effects of chemical reaction:

- Carbon dioxide has green house effect (increase the temperature of the earth) G.R.F. because it allows the thermal rays of the sun to pass through but never let them back
- Carbon monoxide (CO) can cause headache, fainting and may lead to death.
- Sulphur oxides like sulphur dioxide (SO_2) and sulphur trioxide (SO_3), known as acidic gases and they can harm the respiratory system.
- Nitrogen oxides are formed during lightening, also known as acidic gases. They harm the nervous system
- Burning of coal, plastic and cigarettes causes air pollution and causes cancer.

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Evaluation

1-Write the scientific term

1. It's the process in which bonds in reactants are broken and bonds in resultants are formed . []
2. It's a set of symbols and chemical formula representing the reactants and the products molecules in the chemical reaction and the conditions of the reaction. []
3. The total amount of reactants masses is equal to the total amount of products masses . []
4. Poisonous gases that affect on both the eye and the nervous system . []

2-Give reasons for:

1. Magnesium strip burns in the presence of air .
.....
2. A glass rod wet with ammonia solution is exposed to a test tube containing concentrated hydrochloric acid .
.....

3-Complete:

- 1) + $\xrightarrow{\text{Conc.}}$ NHCl type of reaction is (.....)
- 2) C + O₂ $\xrightarrow{\Delta}$ type of reaction is (.....)
- 3) (CO) is dangerous which cause and
- 4) Chemical reaction used in many industries such as and



**4-Give reasons for :**

1. The chemical equation should be balanced .
-

- 2-White clouds are formed after the reaction between ammonia and hydrochloric acid.
-

- 3-A white powder is formed when a magnesium strip burns in air.
-

5-what will happen if:

- 1- Heating magnesium in air .
-

- 2- Reaction of ammonia gas and hydrochloric acid .
-





Lesson

1

Fundamental Forces in Nature

- Any object has two phases:

- Static phase (rest)
- Motion phase (movement)

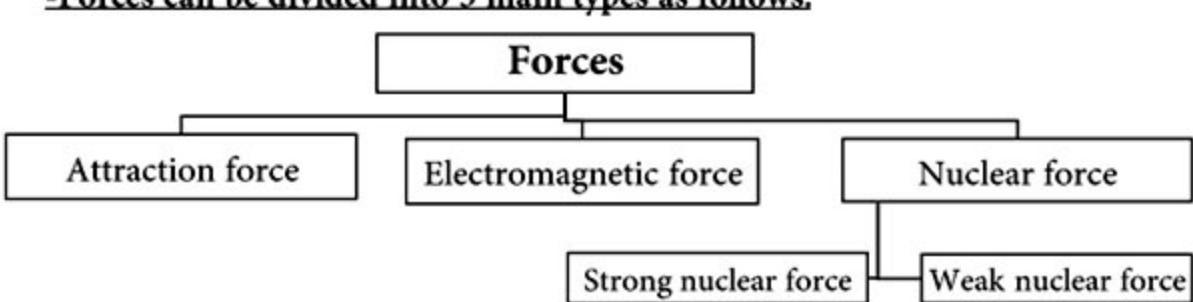
- Any object is static because there is no force acting on it.
- When you exert proper force on a static object, it changes its phase to motion Ex. hitting a ball with your leg.
- Also when you do force on moving object, it changes its direction of movement.

Force

It is an effect that attempts to change the object's phase from static to motion or vice versa or attempts to change the direction of motion

- Unit of force is Newton.
- If you exert force on object and it doesn't move, this is because the exerted force is improper (not enough to move the object). Ex. pushing a wall by your hand.
- There are many forces in nature and they resulted in some phenomena as:
- Lightening - thunder - wind motion

Forces can be divided into 3 main types as follows:



**first: Attraction force**

- All objects are attracted to earth by a force known as "Weight"

Objects weight

The ability of earth to attract object to its center

- This force (weight) increases by increasing mass of object.

$$\text{Weight (Newton)} = \text{Mass (kg)} \times g$$

-g is gravity acceleration (m/sec^2)

-Mass has a fixed value, while weight changes from one place to another

-As the distance from earth's center decreases.

the weight increases and vice versa

Object's effective point: (object's center of gravity)

The point at center of object at which the force of gravity affects the object

Second: Electromagnetic force

Electric current has a magnetic effect.

Structure of electromagnet:

Insulated copper wire coiled around a soft iron nail and the two ends of wires connected to battery

The iron bar becomes a magnet that can attract iron filling

Technological application on electromagnetic force:

- Electromagnet: used in many devices as electric bell and in crane to lift heavy iron blocks

Idea of working: Change electric energy to magnetic energy



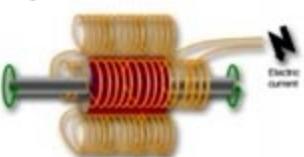


1) Electric generator (dynamo): used to generate electricity

Idea of working: change mechanical energy to electric energy.

2) Electric motor: used in fans and blender

Idea of working: convert electric energy into mecha-



Third: Nuclear force

- The atom stores massive amount of energy inside the nucleus.
- Scientists succeeded to get this nuclear energy out and used it in military and peace
- This massive energy is accompanied by two types of forces:
 - 1) **Weak nuclear force:** used to get radioactive elements and radiation used in medicine, scientific researches and industry
 - 2) **Strong nuclear force:** used to produce electric energy and in military purposes.

Egypt seeks after using nuclear energy in producing electricity.





Evaluation

1) Choose :

- 1- A car of mass 500 kg and another of 1500 kg moves with the same acceleration , the acting force of the greater massthat of the car of the smaller mass .
- equals to
 - equals half
 - equals double
 - equal three time
- 2- The unit of measuring the weight is
- m / sec
 - Joule
 - Newton
 - Kg
- 3- The weight of the body increases as itsincrease .
- distance
 - charge
 - mass
 - square of distance
- 4- If the mass of an object decreases to its half , so the weight
- increases to the double
 - decreases to the half
 - still constant
 - no correct answer

2) Put (✓) or (✗) and correct the wrong:

- When the distance between two bodies is doubled , the gravitational force between them does not change . ()
- weight of the body does not change from place to another on the earth's surface while mass of the body changes. ()
- The unit of measuring weight is Newton / kg . ()
- The atom stores great energy in the electron . ()
- Dynamo is used to change electric energy to magnetic energy . ()
- Strong nuclear forces are used in generating solar energy . ()



**3) Complete :**

1. The mass of the body at the earth's surface isits mass in the moon's surface .
- 2-.....increases as we come near to the earth's center .
3. The electric current haseffect .
4. The work done on raising a body distance increases by increasingof the body.
5. The electromagnet is used in some machines such asand
6. The electric generator is used to changeenergy toenergy like
7. The motor changesenergy toenergy like
8.is used in Egypt to generate electricity .

4) Give reason for :

1. The change of the weight of the body from place to another while the mass of the body is constant .
.....
2. The gravitational force is more obvious between the celestial bodies .
.....
3. The gravitational force between two masses increases as the distance between them decreases .
.....
4. You have to do work when you lift a ball up .
.....

5) Problems

1. A body of mass 50 Kg at the Earth's surface (acceleration due to gravity = 9.8 m/sec^2).
find : a. The weight of the body on the earth .
.....
b. The mass of the body on the moon's surface .
.....
2. Find the mass of a body of weight 300 N. knowing that the gravitational acceleration = 10 m / sec^2

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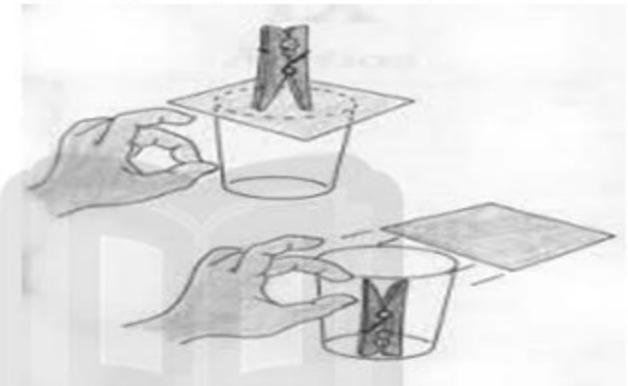


6) What happens if :

1) You push a well by your hand .
.....2) The object's mass increases (relative to the object's weight) .
.....



Any object can't change its phase (motion or rest) unless an external force acted upon it.



Inertia in our daily life:

- 1) Vehicle's passengers and driver move forward when the vehicle stops suddenly.
- 2) Vehicle's passengers and driver move backward when the vehicle starts moving.
- 3) A football player falls on ground if tripped during running.
- 4) A coin falls down in a cup when the card is drawn suddenly.

Notes

- Force of inertia affect on objects in motion and at rest.
- Any object inside the car is having the same car speed.
- Inertia is a force that resists change in object's phase.

Technological application on inertia:

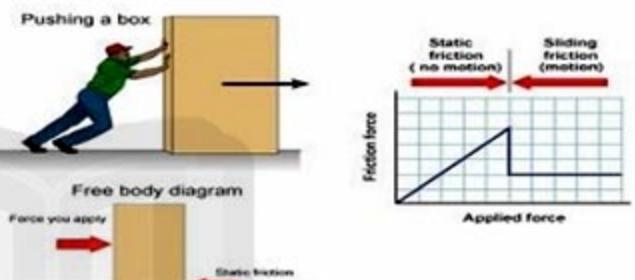
Using safety belt in cars (G.R.F.) to stop the force of inertia and the passengers don't get hurt when sudden change in motion occurs.



**1) Friction force:**

Any object in motion is in friction with the surrounding medium (air, ground, ...)

- Friction force resists motion and it acts in direction opposite to motion.

Friction Forces**Benefits of friction:**

- It prevents slipping down during walking.
- Lightening matches
- It helps to stop and start car's motion (control the car).

Harms of friction:

- Loss of mechanical energy because it is changed into heat energy.
- Internal parts of machines get hot causing their expansion and affects performance of machine
- Erosion and damage of these machine parts.

How to control the friction force?

- Car tires are covered with rough material to increase friction force and controlling the car.
- Using oils & lubricants in mechanical machines to decrease friction force.



**Forces inside living systems:**

- 1) Heart muscle contraction and relaxation helps the heart to pump blood all over the body.
- 2) Pulse inside blood vessels helps the blood to rise to heart from lower parts.
- 3) Contraction and relaxation of muscles help the body organs to move.
- 4) Liquid transport through pores and walls of cells from higher to lower concentration.

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Evaluation

1) Choose :

1. The inertia of the body increases by increasing the body
 a. volume b. mass c. displacement d. density
2. If the net force acting on a body at rest is absent , the body
 a. moves with uniform velocity b. remains at rest
 c. moves with uniform acceleration d. moves with non uniform velocity
3. The frictional force acting on a body isto the direction of motion .
 a. opposite b. in the same direction
 c. parallel d. perpendicular
4. The centrifugal force acting on a body increase by increasing its
 a. weight b. velocity c. volume d. distance
5. Part of the mechanical energy is lost as heat energy due to thebetween the rode and a moving car .
 a. attraction force b. frictional force
 c. centripetal force d. magnetic force

4) Give reason for :

1. On the stop of peddling , the bike stops after a short distance .

2. The fall of a metal coin down in a cup when the card is drawn suddenly .

3. It is difficult for the huge trunks to stop suddenly .





4. It is necessary to use the seat belt while driving .
.....

5. When a person jumps from the bus , he should run a certain distance .
.....

6. Machine must be lubricated from time to time .
.....

3) Write scientific term :

1- An effect attempts to change the object phase from being static to motion or vice versa . [.....]

2- Materials which are used to reduce friction in mechanical machines .
[.....]

3- It is a property of an object has to resist the change in its phase unless an external force acted on it . [.....]

4- A force that help in moving and stopping car and bus . [.....]





Lesson

3

Motion

Motion is the change in object's position as time passes.

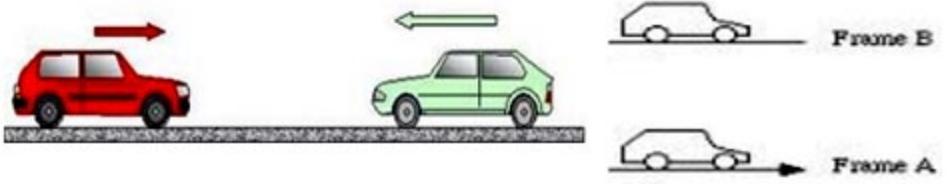
Relative motion:

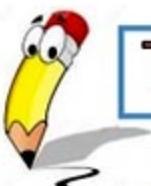
It is the change in object's position or direction as time passes relative to another object or fixed point known as frame of reference.

**Examples on relative motion in our life:**

If you are in a moving car and observing other cars moving by your side, you may observe:

- If one car moves by your side with the same speed, you feel that there is no motion (as if the two cars stop moving).
 - If one car moves against your direction with the same speed or even lower speed, you feel that the other car moves with high speed in opposite direction.
 - If you move beside a stopping car, you feel that this car is moving backward.
- If you stop the car and observe other moving cars, you feel that your car sometimes moves forward and another time moves backward.





Types of motion:

1) Transitional motion:

- The object moves from initial position to final position (end point).
- The object's position changes from time to time relative to a fixed point (frame of reference).

Transitional motion:

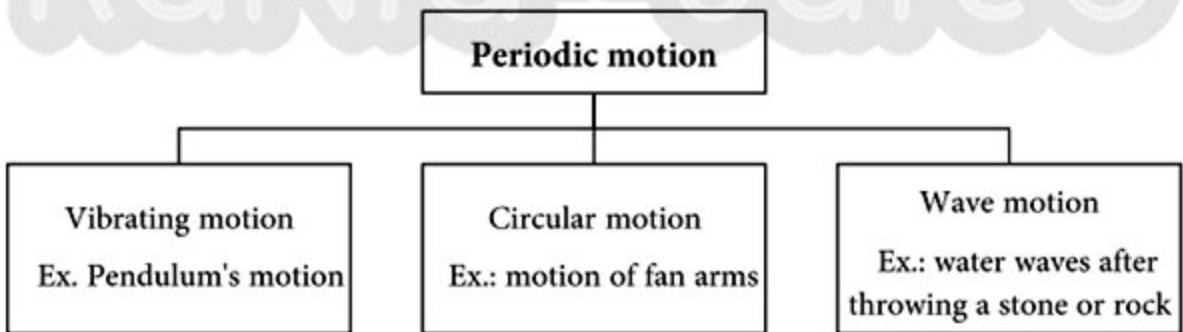
It is the motion in which the object's position changes relative to a fixed point from time to time between initial and final positions.

Examples on transitional motion:

Train motion – bike motion – car motion – football player motion

1) Periodic motion:

It is a motion which is regularly repeated in equal periods of time.



**Wave motion is divided into two types:**

1. Mechanical waves.
2. Electromagnetic waves.

Mechanical waves	Electromagnetic waves
<p>1- Produced due to vibration of medium particles.</p> <p>2- Needs medium to transfer through.</p> <p>3- Its speed is relatively low.</p> <p>Ex.: Sound wave, water waves</p>	<p>1- Accompanied with electromagnetic force</p> <p>2- Spread in all material and non-material media (space).</p> <p>3- Its speed is relatively high.</p> <p>Ex.: light waves, wireless waves, radio & TV waves, UV & IR rays of the sun.</p>

Application on wave motion:

- 1) We see lightning before hearing thunder, although they occur at the same time (G.R.F.)
 - Because thunder (sound) is a mechanical wave which has low speed while lightning is an electromagnetic wave which has very high speed.
- 2) We see the sunlight but we don't hear the sound of solar explosions. (G.R.F.)
 - Because light rays are electromagnetic waves which don't need medium to travel through, while sound is mechanical waves which need medium to travel through.
- 3) Astronauts can't hear each other in space (G.R.F.)
 - Because sound is a mechanical wave which needs medium to travel through, so astronauts use wireless communication (electromagnetic waves).

Technological applications for mechanical waves:

- 1) Examining and curing sets for human body using sound waves (sonar).
- 2) Stringed musical instruments (Ex.: violin, guitar, lute) and pneumatic musical instrument (Ex.: flute, reed pipe).





- 3) Amplifiers and sets for distributing and controlling sound used in broadcasting studios.

Technological applications on electromagnetic waves:

1) Infrared ray used in:

- a. Night vision apparatus used by military force
- b. Cooking food because it has a heat effect.
- c. Remote control sets used to operate different machines.
- d. Remote instruments to photograph earth's surface using satellites



- 1) Ultraviolet rays: used in sterilizing surgical operation rooms

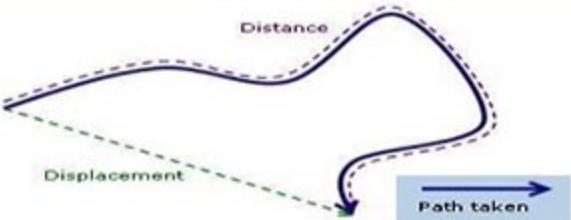
1) X-rays used in:

- a. Photographing bones and detecting fractures.
 - b. Examining mineral rows in industry and showing errors, pores and cracks in minerals.
- 2) Gamma rays: used in treatment and discovering some tumors.
- 3) Visible (seen) light: used in photographic cameras, TV camera and data show.

Graphing motion:

Displacement:

It is the distance moved by an object away from its original position at any moment.



Speed:

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It is the distance covered by an object in unit time.

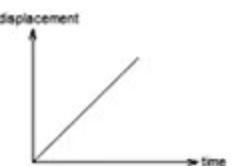




If we graph the displacement / time graphs, we get 3 types of graphs:

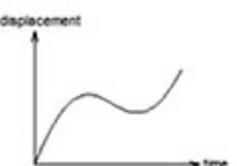
1) Regular (uniform) speed motion:

- Displacements occurred every second are equal
- Represented by a straight line passing through original point



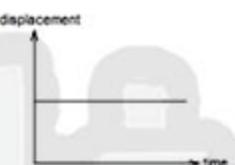
2) Irregular (non-uniform) speed motion:

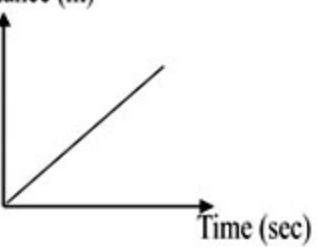
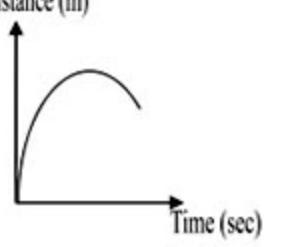
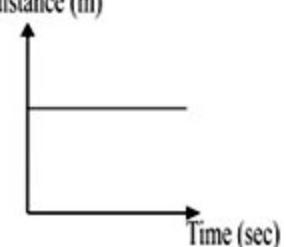
- Displacements occurred every second are not equal
- Represented by a curved line passing through original point.



3) A static object:

- Displacement value is constant (doesn't change as time)



Regular(Uniform)speed	Irregular (Non uniform)speed	Body at rest.
Represented by a straight line passing through the origin point.	Represented by a curved line passes through the origin point.	Represented by a straight line parallel to the time axis.
Distance (m)  Time (sec)	Distance (m)  Time (sec)	distance (m)  Time (sec)

Evaluation



**1-Complete**

- 1- There are two types of motion which are and
- 2- Example of periodic motion
- 2- When an object covers equal at unequal periods of time , so it moves with speed.
- 4-..... andare the two basic factors necessary to describe the motion.
- 3- The speed measuring units areor.....
- 4- The speed of a moving body relative to the observer isspeed.
- 5- The thing that moves with constant speed in the space is

2-Define :

- | | |
|--------------------------|--------------------|
| 1- Transitional motion . | 2- Periodic motion |
| 3- Relative motion . | 4- Speed . |
| 5-Motion. | |

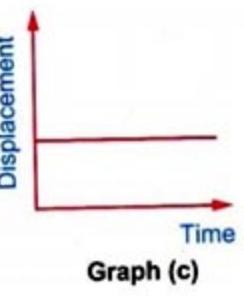
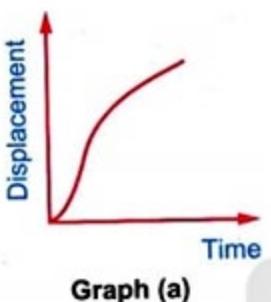
3-Give reason :

- 1- Astronauts can't hear each other voices directly in space .
.....
- 2-The speed of a moving body increases as the covered distance increases at Constant time.
.....
- 3-The train moves at an irregular speed.
.....
- 4-The importance of speedometer in cars and planes.
.....
- 5-A moving car seems to be at rest relative to the rider of another moving car beside it with the same speed and direction.
.....





4- Identify the phase of the movable object in each graph of the following :

 Solve the following problems

- 1- A Bus covers a distance of 120 km with speed 90 km/h then it covers 105 km at 70 km/h .Calculate the time needed to cover the whole distance.
-
.....

- 2- Car (A) moves with speed 60 km/h and car (B) moves in the same direction with speed 90 km /h . Find the relative speed of car (B) relative to an observer is :

a- Stand on the ground.

.....
.....

b- In car (A).

.....
.....

- 3- Two cars move in straight line , car (A) moves at 20 m/s , while car (B) moves at 25 m/s Calculate:

a- The distance covered by each car after one minute
b- The time taken by each car to cover a distance of 100 m.

.....
.....

- 4- A runner covers 450 meters in 45 second . find his speed.
-
.....



Worksheet (3)

Q.1) Complete:

- 1- The chemical equation is a set of and expressing the reactants and in the chemical reaction.
- 2- Burning of coal and cellulose fibers causes and
- 3- $C + O_2 \xrightarrow{\Delta} \dots$
- 4- Sulphur oxides such as and are acidic gases which cause and
- 5- Combination of carbon with oxygen gives gas and this reaction is considered reaction.

Q.2) What is meant by :

- Chemical reaction:

.....
.....

- Chemical equation

.....
.....

- Law of constant ratios

.....
.....
.

Q.3) Put (✓) or (X) and correct the wrong ones:

- 1-Burning of cigarettes causes' lung cancer. ()
- 2- By increasing the ratio of carbon dioxide, the air temperature decreases. ()
- 3- Silver chloride salt is soluble in water. ()
- 4- In the chemical reaction, the bonds of reactants and products are broken. ()
- 5- When ammonia gas reacts with hydrochloric acid, white fumes of ammonium chloride are formed. ()
- 6- Burning fuels produce harmful gases which lead to dangerous effect on environment and human being. ()

Q.4) Calculate the masses of reactants and products in the following reaction:



Knowing that the mass of (S= 32 gm, O = 16 gm)

Worksheet (4)

1-Complete:

- 1- Force can change the of motion of an object.
- 2- The measuring unit of the object's mass is while that of its weight is
- 3- The idea of how the electromagnet works is to change to change into
- 4- Weak nuclear forces are used in
- 5- Egypt seeks to use energy in producing electricity.
- 6- Object's center of gravity is the point at the center of the object at which the force of affects it.
- 7- The electromagnet is made up of an isolated wire coiling around a bar of
- 8- Fundamental forces in nature are divided into , and

Q.1) Choose the correct answer:

1. If the object's mass is 10Kg and the Earth's gravity acceleration is 10m/s^2 , so the object's weight equal
a. 20Newton b. 1 Newton c. 100 Newton d. 50 Newton
2. All of the following are caused by force except
a. moving objects b. change object direction
c. changing mass d. increase object's speed
3. When an object's mass increases to the double, then its weight
a. decreases to half b. is doubled
c. remains constant d. no correct answer

4. The weight of an object changes by changing the of the object.

- a.speed
- b.mass and position
- c.type
- d.all the previous

5. Earth's gravity acceleration at the poles.

- a.increases
- b.decreases
- c.remains constant
- d.no correct answer

6 force is used in making atomic bombs.

- | | |
|-------------------|------------------|
| a.Electromagnetic | b.Gravity |
| c.Weak nuclear | d.Strong nuclear |

Q.2) Write the scientific term:

1- A clean source of energy produced from strong nuclear forces.

(.....)

2- The effect that attempts to change the object's phase from being static to motion or vice versa or attempts to change the motion direction.

(.....)

3- The ability of the earth to attract an object to its center.

(.....)

4- An instrument used to change the electric energy into magnetic energy.

(.....)

5- An instrument used in making electric winches and electric bells.

(.....)

Q.3) Give reason:

1. The direction of a moving ball changes by kicking it with your head.

.....
.....

2. Object's mass remains constant regardless of changing their place on Earth's surface

.....
.....

3.Gravity acceleration changes on Earth's surface from one place to another.

O.4) What happens if:

1.A force effects on a static object.

2.A force effects on a moving object.

3.Moving away from the earth center (concerning mass and weight).

4.Passing electric current in a copper coil around bar.

5.Cutting off the electric current from electromagnet attracting iron filings.

6.Using electric motor in a lot of sets as fan and blender.

O.5) What is meant by:

1-Force:

2-Weight:

O.6) Problems:

1.Find the weight of an object its mass is 500 gm knowing that the Earth's gravity acceleration is 9.8 m/sec^2 .

2. Find the Earth's gravity acceleration for a body whose weight is 98 Newton knowing that its mass is 10 Kg.

3. By knowing that Earth's gravity acceleration in a place is 10 m/s^2 calculate:

- a. An object's mass if its weight is 100 Newton.
- b. An object's weight if its mass is 20 gram.

Q.7) Compare between each pair of the following:

1. Mass and Weight

Mass	Weight

3- Electric generator and Electric motor.

Electric generator	Electric motor.

Worksheet (5)

Q.1-Write the scientific term:

1. It is a property of an object to change its phase from rest to motion. ()
2. Technological application used in cars to prevent the force of inertia when a sudden change in motion occurs. ()
3. Forces that help living organisms ()
4. Substances that are used for decreasing the friction force among the internal moving parts of a machine. ()
5. Force that helps in moving and stopping cars. ()

Q.2-Complete the following sentences:

- 1is from the force that causes the movement of objects.
2. Inertia force effects on.....andobjects.
3. Bus passengers are rushedwhen the bus suddenly stops, due to the
4. Friction force isa force that originates between body and surface.
- 5 is used between the internal moving parts of machines to decrease friction force.
- 6-.....and..... of heart muscle helps in pumping the blood all over the body organs.
7. Liquids transfer through the wall of the cells from theconcentration to the.....concentration.

Q.3-Choose the correct answer:

Q.4-Give reason for:

1. Falling of a coin in the cup by a rapid hitting of the paper.

2. The rider of the bike is rushed forward when he stops suddenly.

.....

3. If a car is at rest, passengers are rushed backwards when the car moves suddenly.

.....

4. The policeman advice the drivers to use safety belts in cars.

.....

5. The car and train have streamline shape.

.....

6. Car tires are covered with grooves.

.....

7. Body muscles contract and relax.

.....

8. Corrosion of gears in the mechanical machines.

.....

Q.5-What happens if:

1. You hit quickly a paper placed over a glass cup and a coin placed over the paper.

.....

2. A moving car stop suddenly (concerning the passengers).

.....

3.The passengers don't use the safety belts in cars and planes.

.....
4.The matches touch a rough surface.

.....
5.Stopping lubricating and oiling of internal moving parts of a machine.

.....
6.Body muscles don't contract and relax.

Q.6-Mention one use for:

1.Inertia force.

.....
2.Friction force.

.....
3.Biological force.

Worksheet (6)

Q.1) Complete:

- 1- The waves causing the wave motion are divided into two types which areand waves.
- 2- Relative motion is the change in an object... oras the time passes relative to another object or fixed point known as.....
- 3- The motion of simple pendulum is known as..... motion, while that is produced from throwing a stone in water is known as..... motion.
- 4- Electromagnetic waves are accompanied by..... forces.
- 5- Thunder sound transfers in a form of.....waves, whereas lightning flash transfers in a form of.....waves.
- 6-rays are used in sterilizing the sets of surgical operation rooms, while.....rays are used in discovering some swellings.
- 7- Infrared rays are used in cooking food because they have...effect property.

Q.2) Give reasons:

- 1- Gamma rays have medical purposes.
.....
.....

- 2- The motion of the simple pendulum is a periodic motion.
.....
.....

- 3- A train motion is a translational motion.
.....
.....

4- Sound and water waves are mechanical waves.

.....

Q.3) What is meant by?

1- Relative motion:

.....

2- Periodic motion:

.....

3- Translational motion:

.....

4- Speed:

.....

Lesson 3 Worksheet 1

Complete:

1. The chemical equation is a set ofand..... expressing the reactants andmolecules in the chemical reaction
2. The chemical equation should be to achieve the law of
3. Combination of carbon and oxygen givesgas and this reaction is considered.....reaction
4.and.....are among products of fuel burning

Put (✓) or (X):

1. The reaction of magnesium and oxygen is considered a direct combination reaction between 2 nonmetal elements (.....)
2. Sulphur dioxide gas acts as a greenhouse effect (.....)
3. By increasing the ratio of carbon dioxide, the temperature decrease (.....)
4. Carbon oxides have bad effects on the nervous system and the eye (.....)
5. Burning of cigarettes causes lung cancer (.....)

What is meant by:

1. Chemical reaction:

.....

2. Chemical equation:

.....

Give reason:

1. The mass of magnesium is increased when it is burned

.....

2. Burning of fuel is among the reactions that pollute the environment

Lesson 3 sheet 2

Choose:

1. The bright magnesium ribbon changes into a white powder ofwhen it burns in air
 - a) magnesium nitrite
 - b)magnesium oxide
 - c)magnesium hydroxide
 - d)magnesium dioxide
2. The sum of reactants masses in any chemical reaction isthe sum of product masses
 - a)doubled
 - b)more than
 - c)less than
 - d)equal to
3. Direct combination reaction takes place between.....
 - a)2 nonmetals
 - b)a metal and a nonmetal
 - c)2 compounds
 - d) all the previous
4. The gases that cause building corrosions are.....
 - a)nitrogen oxides
 - b)carbon oxides
 - c)sulphur oxides
 - d) b and c
5.oxides are resulted during the time of lightning
 - a)carbon
 - b)sulphur
 - c)nitrogen
 - d) a and b

Write the scientific term:

- 1- The sum of reactants masses in any chemical reaction equals the sum of products masses (.....)
- 2- Reactions which involve combination between an element with another or a compound with another (.....)
- 3- The gas which acts as a greenhouse effect (.....)
- 4- Poisonous gases that effect both the eye and the nervous system (.....)

Give reason:

- 1- Burning of coal and cellulose fibers has bad effect

.....

Lesson 1 worksheet 1

Complete:

- 1-and.....forces are the main three divisions of forces in the nature
- 2- Atom stores a massive amount of energy inside it's.....
- 3- The nuclear forces can be divided into.....and.....
- 4- Electric fan is from devices that change.....energy into.....energy
- 5- Electromagnet is used in making.....and.....
- 6-and.....are the factors affecting the gravitational force between the earth and the object

Give reason:

- 1- Mass of an object remains constant by changing its position on earth
.....

- 2- Electric motor is used in making fans and washing machine
.....

- 3- When you push wall, it doesn't move
.....

Calculate 1) the weight of an object of 5 kg mass (acceleration due to gravity is 10 m/sec²)
.....

2) the mass of a child, its weight is 392 newton.(acceleration due to gravity = 9.8 m/sec²)
.....

Write the scientific term:

- 1- The amount of earth's gravitational pull on an object [.....]
- 2- Device used to change the mechanical energy to electric energy [.....]
- 3- The measuring unit of weight [.....]

Lesson 1 sheet 2

Choose:

- 1-is the measuring unit of the force
a) newton b) meter c) kilogram d) coulomb
- 2- The work done to lift an object upwards increases by increasing object's.....
a) volume b) mass c) density d) no correct answer
- 3- The bar used in electromagnet is made up of.....
a) isolated copper b) wrought iron c) steel iron d) aluminium
- 4-changes the mechanical energy into an electric energy
a) electromagnet b) dynamo c) electric motor d) no correct answer
- 5- We can obtain electric energy from all the following Except.....
a) dynamo b) electric motor c) electric power station

Give reason for:

- 1- An object's weight is changed from place to another

.....

- 2- The importance of nuclear force

.....

- 3- Weight of object is always greater than its mass

.....

Calculate:

- 1- Mass of an object if its weight is 980 newton and the earth's gravitational acceleration is 9.8 m/sec²

.....

.....

- 2- If the earth's gravitational acceleration is 9.8 m/sec² find weight of ball its mass is 0.3kg

Lesson 2 sheet 1

Complete:

- 1-and.....are among the accompanied forces to motion
- 2-force prevents feet from slipping on roads during.....
- 3-and.....from benefits of friction
- 4- Heart muscle contract and relax to.....
- 5- Liquids transport through the walls of the cells from theconcentration toconcentration

Put (✓) OR (✗):

- 1- Passengers are rushed backward when a car stops suddenly ()
- 2- Friction always opposes motion ()
- 3- Car tyres are covered with a very smooth substance to increase the friction force ()
- 4- Friction may occur between the surface of a solid object and air ()

Write the scientific term:

- 1- A technological application is used in cars to stop the forces of inertia when a sudden change in motion occurs [.....]
- 2- A property of an object has to resist the change of its state of rest or motion at regular speed in a straight line unless an external force acted on it [.....]

Give reason for:

- 1- The fan is going to turn after the electric current goes off

.....

- 2- When you drive a car in a city traffic for some time, the brakes become hot

.....

- 3- Parts of car are covered with grease

.....

- 4- Blood is pumped all over the body organs

.....

Lesson 2 sheet 2

Choose:

- 1- All the following are accompanied forces to motion Except.....
a)friction force b)gravitational force c)force of inertia d)forces inside living system
- 2- The inertia force affects theobjects
a)moving b)static c)moving and static d)no correct answer
- 3- Friction causes a great loss of mechanical energy because this energy is changed into.....energy
a)light b)electric c)magnetic d)heat
- 4- The idea of machines lubricant depends on the decrease in
a)weight b)force of inertia c)friction force d)forces of gravity
- 5- Water transports from soil to leaves of plant by the effect of
a)gravitational force b)biological forces c)inertia force d)friction force

What's meant by :

1- **Inertia:**.....
.....

2- **Frictionforce:**.....
.....

Give reason for:

- 1- The car passengers are rushed forward when the moving car stops suddenly.
.....
- 2- You can easily walk on grass than ice
.....
- 3- Policeman advise drivers to use safety belts in cars and planes
.....

Put (✓) OR (✗):

- 1- Oils and lubricants have no effect on friction ()
- 2- Car brakes are from applications on friction forces ()
- 3- Contraction and relaxation of body muscles help in moving ()

Lesson 3 sheet 1

Complete:

- 1) Types of motions are motion and motion
- 2) The movement of moon around earth is a motion, while that of train is a motion
- 3) and are examples of periodic motion
- 4) Sound waves and waves are examples of waves
- 5) mechanical waves are produced due to the of the medium particles
- 6) and are emitted from sun
- 7) rays are used in cooking food as they have effect

Put (✓) OR (✗)

- 1) Periodic motion is changed between start and final positions ()
- 2) Simple pendulum motion is a wave motion ()
- 3) Water waves motion is a periodic motion ()
- 4) Water waves are electromagnetic waves ()
- 5) Gamma rays are used in photographing bones ()
- 6) We use infrared rays in data show ()

Mention one application:

- 1) Sound waves:.....
- 2) X-rays:
- 3) Gamma rays:
- 4) Infrared rays:

Give reason:

- 1) A train motion is a transitional motion

.....

2) We see lightning before hearing thunder although they occur at the same time

.....
.....

3) Sound and water are mechanical waves

.....

Lesson 3 sheet 2

Choose:

- 1) The motion of the following objects are transitional motion Except motion of....
a)train b)simple pendulum c)car d)bicycle
- 2) Sounds are produced due to.....
a)vibration of medium particles b)electromagnetic forces
c)electrostatic forces d>wave motion
- 3)waves is an example of mechanical waves
a)water b)light c)radio d)ultraviolet
- 4)are used in examining and curing sets for human body
a)ultrasonic waves b)gamma rays c)infrared rays d)x-rays
- 5)rays are used in night vision apparatus
a)infrared b)gamma c)ultraviolet d>x-rays

Write the scientific term:

- 1) It is a change of an object's position or direction as time passes relative to a fixed point [.....]
- 2) The motion which is regularly repeated in equal periods of time [.....]
- 3) Waves don't need medium to travel through [.....]

Give reason:

- 1) Exposing dental treatment tools for ultraviolet rays before reuse